

About iMcV Modules

iMcV Modules are SNMP-manageable and install in the modular, SNMP-manageable iMediaCenter and iMcV series chassis as well as the MediaChassis series, which is unmanaged. The following media conversion and fiber mode conversion iMcV Modules are explained in this manual:

Information for other iMcV Modules can be found in their respective manuals, and on the IMC Networks Web site at <http://www.imcnetworks.com/tech/techsup.asp>

QUICK START

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- **iMcV-PIM:** Ethernet module provides a single conversion between 10Base-T twisted pair and 10Base-FL single-mode or multi-mode fiber. Each iMcV-PIM includes one RJ-45 connector and one pair of ST or SC fiber optic connectors.
- **iMcV-LIM:** Fast Ethernet module provides a single conversion between 100Base-TX twisted pair and 100Base-FX/SX single-mode or multi-mode fiber. Each iMcV-LIM includes one RJ-45 connector and one pair of ST or SC fiber optic connectors (or one small form factor connector). Also available in a single-strand fiber version, iMcV-LIM TX/SSFX allows two wavelengths to share one fiber strand — Full-Duplex data travels on different wavelengths (1310 nm and 1550 nm) — doubling the capacity of fiber. Includes one RJ-45 connector and one SC fiber connector.
- **iMcV-ATM:** ATM module provides a single conversion between OC-3 (155 Mbps) twisted pair and fiber. Each iMcV-ATM includes one RJ-45 connector and one pair of SC fiber optic connectors.
- **iMcV-Gigabit:** Gigabit Ethernet module provides a single conversion between 1000Base-T twisted pair and 1000Base-SX/LX fiber. Each iMcV-Gigabit includes one RJ-45 connector and one pair of SC fiber optic connectors.
- **iMcV-S2MM/M2MM/S2SM:** Protocol-independent modules provide a single conversion between single-mode and multi-mode (S2MM) fiber, 1300 nm to 1550 nm single-mode (S2SM), or 850 nm to 1300 nm multi-mode (M2MM). Supported transmission speeds are: 10-155 Mbps and 622- 1250 Mbps. Each module includes two pairs of ST or SC fiber optic connectors (or small form factor connector).

NOTE: Supported fiber includes 850 and 1300 nm multi-mode and 1310 and 1550 nm single-mode.

Configuration Instructions

Many *iMcV Modules* have user-configurable features (e.g., *FiberAlert*, *LinkLoss*, *Auto-Negotiation*, *Duplex mode*, etc.). Please see the chart on page 3 for information on which features are available on which module.

Following are instructions for configuring both managed (via an SNMP-compatible management application like *iView*²) and unmanaged modules.

MANAGED MODULES

To manage one or more *iMcV Modules*, an SNMP agent must be present in the chassis: *iMediaCenter* chassis have embedded management; *iMcV Series* chassis use an *iMcV Master* module. To configure managed modules, install the module first (see page 7 for instructions), then configure using the management software. Refer to the *iView*² for *MediaConverters* online help file for more information and assistance.

NOTE

Management software will override any hardware settings (e.g., jumper, switch, etc.), so you **MUST** configure a module that will be managed via the software. Until you configure a managed module via the software, the module (and its LEDs) may not work properly.

UNMANAGED MODULES

Before installing, configure *iMcV Modules* for desired features. The chart on the following page states the available features and settings for each module. The diagram shows the jumper/switch locations on *iMcV-PIM TP/FO*, *iMcV-LIM TX/FX*, *iMcV-LIM TX/SSFX* and *iMcV-Gigabit* (there are no user-set jumpers/switches on *iMcV-ATM*, or *iMcV-S2MM/ S2SM/ M2MM*).

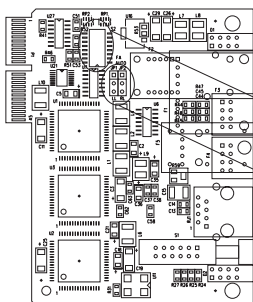
After configuring the jumpers/switches for the desired settings, install the module (see page 7 for instructions) and connect the appropriate cables.

INSTALLATION TIP

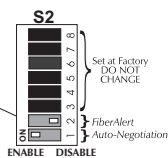


When testing, IMC Networks recommends you test your module first in an **unmanaged** environment. To do this, disable management (i.e., turn management off or remove the management module from an *iMcV Series* chassis), follow the unmanaged configuration instructions (see opposite page), then install the unit, connect the cables and test the LEDs. When finished, re-activate management and configure the unit via the software.

IMCV MODULE JUMPER/SWITCH CONFIGURATION CHART					
Module	Feature	Jumper/Switch	ON	OFF	Default
iMcV-PIM TP/FO	FO LinkLoss	JP2	1-2	2-3	OFF
	FiberAlert	JP3	1-2	2-3	OFF
	TP LinkLoss	JP6	1-2	2-3	OFF
iMcV-LIM TX/FX -30 Board	FX LinkLoss	JP2	1-2	2-3	OFF
	TX LinkLoss	JP3	1-2	2-3	OFF
	Auto-Negotiation	DIP Switch 1 on S1	see diagram	see diagram	ON
	FiberAlert	DIP Switch 2 on S1	see diagram	see diagram	OFF
iMcV-LIM TX/FX -20 Board	FX LinkLoss	JP1	1-2	2-3	OFF
	TX LinkLoss	JP2	1-2	2-3	OFF
	Auto-Negotiation	DIP Switch 1 on S2	see diagram	see diagram	ON
	FiberAlert	DIP Switch 2 on S2	see diagram	see diagram	OFF
iMcV-LIM TX/SSFX	Auto-Negotiation	DIP Switch 1 on S1	see diagram	see diagram	ON
	FX LinkLoss	JP2	1-2	2-3	OFF
	TX LinkLoss	JP3	1-2	2-3	OFF
iMcV-GIGABIT	Duplex Setting	DIP Switch 1 on S1	see diagram	see diagram	ON (FDX)
	Master/Slave	DIP Switch 2 on S1	see diagram	see diagram	OFF (SLAVE)
	FiberAlert	DIP Switch 4 on S1	see diagram	see diagram	OFF

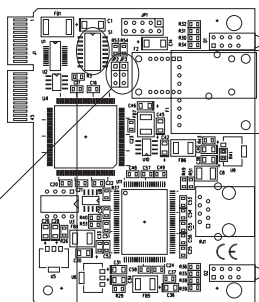


iMcV-LIM TX/FX-20
w/MDI/MDI-X button



JP1 = FX LL
JP2 = TX LL

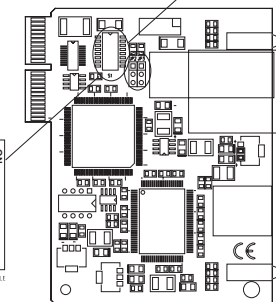
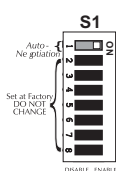
JP2 = FX LL
JP3 = TX LL



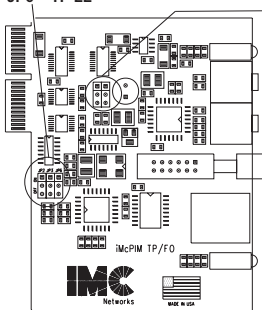
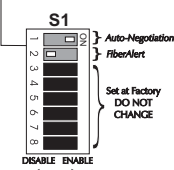
iMcV-LIM TX/FX-30
w/AutoCross feature



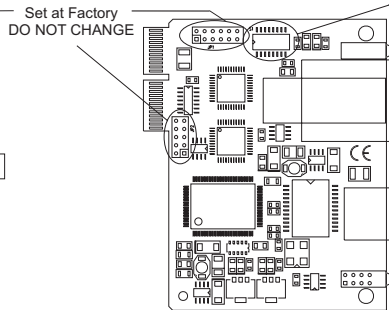
JP2 = FO LL
JP3 = FiberAlert
JP6 = TP LL



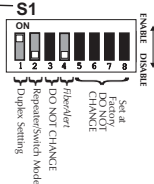
iMcV-LIM TX/SSFX



iMcV-PIM



iMcV-Gigabit



About LinkLoss and FiberAlert

Some *iMcV Modules* include advanced troubleshooting features that help locate "silent failures" on your network. Troubleshooting features include:

- *FO/FX LinkLoss* (a.k.a. "*Fiber LinkLoss*" or "*LinkLoss*")
- *TP/TX LinkLoss* (a.k.a. "*Twisted Pair LinkLoss*" or "*Reverse LinkLoss*")
- *FiberAlert*

It is vital that you understand how *FiberAlert* and *LinkLoss* work, and how they will react in your network configuration, before attempting to install the enclosed module(s).



Installing modules without understanding the effects of *FiberAlert* and *LinkLoss* can cause perfectly functioning units to appear flawed or even dead.

ABOUT LINK INTEGRITY

During normal operation, link integrity pulses are transmitted by all point-to-point Ethernet devices. When an IMC Networks media converter receives valid link pulses, it knows that the device to which it is connected is up and sending pulses, and that the copper or fiber cable coming from that device is intact. The appropriate "LNK" (link) LED is lit to indicate this.

The IMC Networks media converter also sends out link pulses from its copper and fiber transmitters, but normally has no way of knowing whether the cable to the other device is intact and the link pulses are reaching the other end. The combination of *FiberAlert* and *LinkLoss* allows this information to be obtained, even when physical access to a remote device (and its link integrity LED) is not available.

WHAT IS FO/FX LINKLOSS?

FO/FX LinkLoss is a troubleshooting feature. When a fault occurs on the fiber segment of a conversion, *FO/FX LinkLoss* detects the fault and passes this information to the twisted pair segment. If a media converter is not receiving a fiber link, *FO/FX LinkLoss* disables the transmitter on the media converter's twisted pair port. This results in a loss of link on the device connected to the twisted pair port.

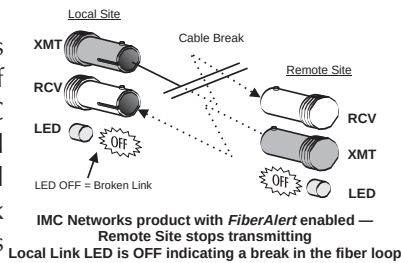
WHAT IS TP/TX LINKLOSS?

TP/TX LinkLoss is another troubleshooting feature. When a fault occurs on the twisted pair segment of a conversion, *TP/TX LinkLoss* detects the fault and passes this information to the fiber segment. If a media converter is not receiving a twisted pair link, *TP/TX LinkLoss* disables the

transmitter on the media converter's fiber port. This results in a loss of link on the device connected to the fiber port.

WHAT IS FIBERAlert?

FiberAlert minimizes the problems associated with the loss of one strand of fiber. If a strand is unavailable, the IMC Networks device at the receiver end notes the loss of link. The device will then stop transmitting data and the link signal until a signal or link pulse is received. The result is that the link LED on BOTH sides of the fiber connection will go out indicating a fault somewhere in the fiber loop. Using *FiberAlert*, a local site administrator is notified of a fault and can quickly determine where a cable fault is located.



NOTE

Enable *FiberAlert* on ONE side of a media conversion only. Enabling it on both sides would keep both transmitters off indefinitely!

USING FIBERAlert AND LINKLoss

The following chart provides an overview of the troubleshooting features, their functionality and the recommended settings for a pair of media converters in a typical central/main site to remote site application:

LINKLoss / FIBERAlert COMPARISON TABLE			
Feature	Fault Location	Disabled LEDs	Enable At:
FX LinkLoss	Fiber	Twisted Pair	Main Site Only
TX LinkLoss	Twisted Pair	Fiber	Remote Site Only
FiberAlert	Fiber	Fiber	Remote Site Only

This will ensure that any faults, no matter where they occur, can be detected by an administrator located at the central site.

For more information on *LinkLoss* and *FiberAlert*, please visit the IMC Networks Web site at <http://www.imcnetworks.com/tech/ref-features.asp>. If you are unsure of how best to implement these features in your configuration, please contact IMC Networks technical support at (800) 624-1070 (U.S./Canada), +32-16-550880 (Europe) or via e-mail at: techsupport@imcnetworks.com.

CONFIGURING LINKLoss AND FIBERAlert

iMcV-PIM, *iMcV-LIM* and *iMcV-Gigabit Modules* ship from the factory with troubleshooting features disabled. See the configuration instructions on pages 2 through 5 of this manual for instructions on enabling *FiberAlert* and *LinkLoss*.

Master/Slave Mode on iMcV-Gigabit

iMcV-Gigabit negotiates between Master and Slave mode. To avoid conflicts with devices connected to *iMcV-Gigabit*, it senses which mode is appropriate, then selects that mode. *iMcV-Gigabit* also negotiates between Half- and Full-Duplex.

When connected to a NIC or a switch, *iMcV-Gigabit* typically functions as a Master; the NIC/switch auto-negotiates to determine which of its modes will not cause conflict with *iMcV-Gigabit*. When two *iMcV-Gigabit* Modules are connected to each other, the devices will communicate and resolve which will operate as a Master and which will be the Slave. During negotiation, errors may be seen; the device returns to its normal operation after a short period of time.

Twisted Pair Crossover/Pass-Through Connections

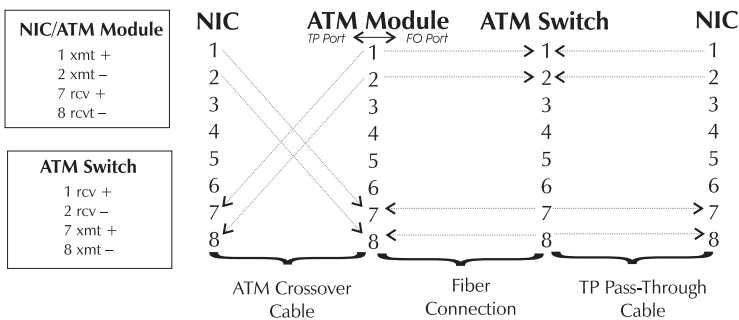
iMcV Modules support both crossover and straight-through Cat5 twisted pair cabling types of connections by one of the following two methods:

AutoCross: *iMcV-LIM* and *iMcV-Gigabit Modules* include *AutoCross*, a feature which automatically selects between a crossover workstation or pass-through/repeater hub connection depending on the connected device.

MDI/MDI-X Switch: *iMcV-PIMs* feature a push button switch, located next to the RJ-45 connector, for selecting the type of connection. Select a pass-through connection by pressing the push-button **IN**. The button should be in the **OUT** position for a crossover connection. If unsure of the type of connection, set the push button to a position that makes the twisted pair LNK (link) LED glow.

Crossover/Pass-Through for ATM Modules

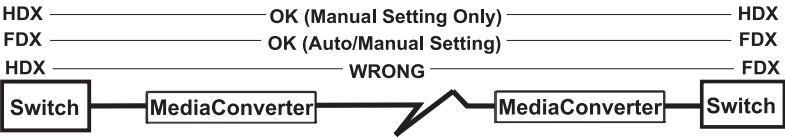
Twisted pair ports on *ATM Modules* do not feature a crossover/pass-through switch nor *AutoCross*; therefore, you must use the correct ATM cable for your installation. Use the following crossover pin chart as a guide to which type of cable to use (shows typical use of crossover cable).



Auto-Negotiation on iMcV-LIM

iMcV-LIM Modules include the feature *Auto-Negotiation*. When *Auto-Negotiation* is enabled, the module negotiates as a 100 Mbps Full-Duplex device; if the device the *iMcV-LIM* is connected to can operate at 100 Mbps Full-Duplex, a link will be established.

If the twisted pair port on the other device does not have the ability to auto-negotiate, or if a 100 Mbps Half-Duplex connection is desired, *Auto-Negotiation* on *iMcV-LIM* must be disabled. Half- and Full-Duplex settings must be manually set, and match, on both devices connected to the *iMcV-LIM*. The diagram below page shows a typical application, followed by a table with three possible configurations.



End to End Connection	Switch	TX/FX
Half-Duplex	Manually configure HDX	Auto-Negotiation Off
Full-Duplex	Manually configure FDX	Auto-Negotiation Off
Full-Duplex	Auto-Negotiation On	Auto-Negotiation On

Configure *Auto-Negotiation* on an *iMcV-LIM* by adjusting the DIP switch setting (for unmanaged modules) or via the management software. Please see the diagrams on page 3 of this manual for switch location and settings.

Installing an iMcV Module

iMcV Modules install in any IMC Networks SNMP-manageable media converter chassis or in any *MediaChassis*. To install an *iMcV Module*, remove the blank bracket covering the slot where the module is to be installed by removing the screws on the outside edges of the bracket. Slide the *iMcV Module* into the chassis, via the cardguides, until the module is seated securely in the connector. Secure the module to the chassis by tightening the captive screw. Save any “blanks” removed during installation for future use should configuration requirements change.

Power Limitations

Due to the high power demands of *iMcV-Gigabit*, you cannot fully populate some *iMediaCenter/18x* and *iMcV/18x* chassis with this module. The chart on the next page shows the maximum number of modules each power supply can accommodate. If using *iMcV-Gigabit* and other *iMcV Series* modules in combinations, please consult IMC Networks Web

site at www.imcnetworks.com for more information or contact IMC Networks technical support by phone at (949) 465-3000, (800) 624-1070 (U.S. and Canada), +32-16-550880 (Europe) or via e-mail at: techsupport@imcnetworks.com

MAXIMUM MODULES FOR iMEDIACENTER/18 AND iMcV/18		
MODULE	60W AC/70W DC	100 DC/110W AC
iMcV-Gigabit	10	13

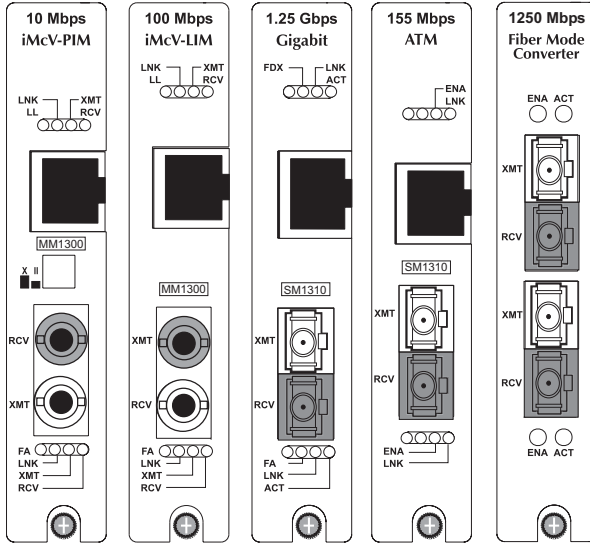
Installation Troubleshooting

- During installation, first test the fiber and twisted pair connections with all troubleshooting features disabled, then enable these features, if desired, just before final installation. This will reduce the features' interference with testing.
- When working with units where the features cannot be disabled, you must establish BOTH your twisted pair and fiber connections before the link LEDs will light!
- To test a media converter by itself, first make sure you have an appropriate fiber patch cable, then follow these steps to test:
 - Step 1:** Connect the media converter to the twisted pair device with a twisted pair cable.
 - Step 2:** Loop a single strand of fiber from the transmit port to the receive port of your media converter.
 - Step 3:** Verify that you have both twisted pair and fiber link (see LEDs, below) on your media converter.
- Make sure to use the appropriate twisted pair cable, and have the crossover/pass-through switch set correctly.
- Whenever possible, set the devices connected to the media converter (hub, switch, NIC card) to the desired speed and Duplex setting, and turn *Auto-Negotiation* OFF. (See page 7 for information on *Auto-Negotiation*.) Also make sure to configure the devices on the opposite sides of the media converter to operate at the same speed and Duplex setting.

NOTE
Some 10/100 devices can't be set by the end user, and must auto-negotiate to receive a signal.

LED Operation

Each *iMcV Module* features diagnostic LEDs (see following diagram) that provide information on features and ports.



LEDs on iMcV-LIM TX/FX and TX/SSFX and iMcV-PIM TP/FO

The LEDs and their locations are the same on *iMcV-LIM TX/FX* and *iMcV-PIM TP/FO* Modules. The LED functions are as follows:

- RCV** Blinks yellow when port is receiving data.
- XMT** Blinks green when port is transmitting data.
- LNK** Glows green when a link is established on the port.
- LL** Glows green when *FX LinkLoss* is enabled.
- FA*** Glows green when *FiberAlert* is enabled.

*FiberAlert is not available/applicable on single-strand versions of *iMcV-LIM*.

LEDs on iMcV-S2MM/S2SM/M2MM

The LED functions on *iMcV-S2MM/S2SM/M2MM* are as follows:

- ENA** Glows green when port is enabled.
- ACT** Glows yellow in normal operation, indicating that fiber is connected and the receiver is seeing light pulses. (As these are protocol-independent modules, there is no true "link" signal available.)

LEDs on iMcV-ATM

The LED functions on *iMcV-ATM* are as follows:

- ENA** Glows green when port is enabled.
- LNK** Glows yellow when valid ATM cells are received (the ATM equivalent of "link" on Ethernet).

LEDs on iMcV-Gigabit

- ACT Glows yellow when data is detected on the port.
- LNK Glows green when a twisted pair *link* is established.
- FDX Glows green when operating in *Full-Duplex* mode.
- FA Glows green when *FiberAlert* is enabled.

General Information

IMC NETWORKS TECHNICAL SUPPORT

- Phone: (949) 465-3000 or (800) 624-1070 (in the U.S./Canada);
+32-16-550880 (Europe)
- Fax: (949) 465-3020
- E-Mail: techsupport@imcnetworks.com
- Web: www.imcnetworks.com

FIBER OPTIC CLEANING GUIDELINES

Fiber optic transmitters and receivers are extremely susceptible to contamination by particles of dirt or dust which can obstruct the optic path and cause performance degradation. Good system performance requires clean optics and connector ferrules.

- 1) Use fiber patch cords (or connectors, if you terminate your own fiber) only from a reputable supplier; low-quality components can cause many hard-to-diagnose problems in an installation.
- 2) IMC Networks installs dust caps to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. Assure that the fiber is properly terminated, polished and free of any dust or dirt and that the location is as free from dust and dirt as possible.
- 3) Store spare caps in a dust-free environment such as a sealed plastic bag or box so that, when reinstalled, they do not introduce any contamination to the optics.
- 4) Should it be necessary to disconnect the fiber device, reinstall the protective dust caps.
- 5) If you suspect that the optics have been contaminated, alternate between blasting with clean, dry, compressed air and flushing with methanol to remove particles of dirt.

ELECTROSTATIC DISCHARGE PRECAUTIONS

Electrostatic discharge (ESD) can cause damage to your add-in modules. Always observe the following precautions when installing or handling an add-in module or any board assembly.

- 1) Do not remove unit from its protective packaging until you're ready to install it.
- 2) Wear an ESD wrist grounding strap before handling any module or component. If you do not have a wrist strap, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.



WARNING! Integrated circuits and fiber optic components are extremely susceptible to electrostatic discharge damage. Do not handle these components directly unless you are a qualified service technician and use tools and techniques that conform to accepted industry practices.

- 3) Hold boards by the edges only; do not touch the electronic components or gold connectors.
 - 4) After removal, always place the boards on a grounded, static-free surface, ESD pad or in a proper ESD bag. Do not slide the board over any surface.
-

SPECIFICATIONS

Environmental

Operating Temperature: 32° - 104° F (0° - 40° C)

Storage Temperature: 0° - 160° F (-20° - 70° C)

Humidity: 5 - 95% (non-condensing)

Power Consumption (Typical)

iMcV-PIM: 0.30 Amp.

iMcV-LIM: 0.80 Amp.

iMcV-ATM: 0.55 Amp.

iMcV-S2MM/M2MM/S2SM: 0.62 Amp.

iMcV-Gigabit: 1.30 Amp.

Fiber Optic Specifications

For fiber optic specifications, visit our Web site at

<http://www.imcnetworks.com/adocs/fcs.asp>

WARRANTY

IMC Networks warrants to the original end-user purchaser that this product, EXCLUSIVE OF SOFTWARE, shall be free from defects in materials and workmanship under normal and proper use in accordance with IMC Networks' instructions and directions for a period of six (6) years after the original date of purchase. This warranty is subject to the limitations set forth below.

At its option, IMC Networks will repair or replace at no charge the product which proves to be defective within such warranty period. This limited warranty shall not apply if the IMC Networks product has been damaged by unreasonable use, accident, negligence, service or modification by anyone other than an authorized IMC Networks Service Technician or by any other causes unrelated to defective materials or workmanship. Any replaced or repaired products or parts carry a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

To receive in-warranty service, the defective product must be received at IMC Networks no later than the end of the warranty period. The product must be accompanied by proof of purchase, satisfactory to IMC Networks, denoting product serial number and purchase date, a written description of the defect and a Return Merchandise Authorization (RMA) number issued by IMC Networks. No products will be accepted by IMC Networks which do not have an RMA number. For an RMA number, contact IMC Networks at PHONE: (800) 624-1070 (in the U.S. and Canada) or (949) 465-3000 or FAX: (949) 465-3020. The end-user shall return the defective product to IMC Networks, freight, customs and handling charges prepaid. End-user agrees to accept all liability for loss of or damages to the returned product during shipment. IMC Networks shall repair or replace the returned product, at its option, and return the repaired or new product to the end-user, freight prepaid, via method to be determined by IMC Networks.

IMC Networks shall not be liable for any costs of procurement of substitute goods, loss of profits, or any incidental, consequential, and/or special damages of any kind resulting from a breach of any applicable express or implied warranty, breach of any obligation arising from breach of warranty, or otherwise with respect to the manufacture and sale of any IMC Networks product, whether or not IMC Networks has been advised of the possibility of such loss or damage.

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FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The use of non-shielded I/O cables may not guarantee compliance with FCC RFI limits.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

Questions or Comments about this manual? Contact techdocs@imcnetworks.com.



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